ALY 3/22/01 #14

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	:	Docket No.: OT-4331
Richard J. Ericson	:	Date: March 22, 2001
Serial No.: 09/162,821	:	Group Art: 3652
Filed: September 29, 1998	:	Examiner: S. McAllister

Title: ELEVATOR SYSTEM HAVING DRIVE MOTOR LOCATED BELOW THE ELEVATOR CAR

Commissioner for Patents
Washington, D.C. 20231

Sir:

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES
APPEAL BRIEF TRANSMITTAL

Three copies of applicant(s) Appeal Brief are transmitted herewith.

[X] Since oral hearing is not requested, only the brief fee of $310.00 is required.

[ ] Oral hearing is requested and a fee of $270 is required in addition to the brief fee of $310.

Please charge the total fee of $310.00 to Deposit Account No. 15-0750, Order No. OT-4331. Charge any additional fees or credit any overpayments to Deposit Account 15-0750. A duplicate copy hereof is enclosed.

Respectfully submitted,

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3-22-01
Date

Commissioner for Patents
Washington, D.C. 20231

Sir:

APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

1. REAL PARTY IN INTEREST

The real party in interest is Otis Elevator Company. The assignment of assignor's interest was recorded on December 4, 1998, at reel 9622, frame 0467.

2. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

3. STATUS OF CLAIMS

Claims 2, 5, 6, 16, 19 and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Gale in view of Tokyo Rope.

Claims 3, 17 and 18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Gale in view of Tokyo Rope, and further in view of Murtaugh.

Claims 13, 14, 27 and 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over Gale in view of Tokyo Rope, and further in view of Aulanko et al.

Claims 2-4 and 16-19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Murtaugh in view of Gale and Tokyo Rope.

Claims 7 and 21 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. STATUS OF AMENDMENTS

No amendments were submitted subsequent to the Final Rejection.

5. SUMMARY OF INVENTION

Claims 2 and 16 are directed to an elevator system comprising a hoistway, a car within the hoistway, and a drive motor including a drive sheave located at a bottom portion of the hoistway. The drive motor is coupled to the car by at least one flat rope. The flat rope further includes a suspension rope coupled to the car and counterweight and a drive rope engaged with the drive sheave.

One of the principle benefits of this invention is minimized space requirements for the elevator system, as measured in both vertical and horizontal cross-sections of the elevator system. First, there is no machineroom required because the drive motor is located in the hoistway. Second, the drive motor is located in the bottom portion of the hoistway so that no vertical extension of the top of the hoistway is necessary. Third, the invention takes advantage of the use of flat ropes as drive ropes to minimize the drive sheave diameter, and thereby the drive motor size, and as suspension ropes to minimize the deflector sheave diameters, and thereby any space required for the suspension rope system. This results in requiring minimal space within the hoistway for the drive motor, drive sheave and the deflector sheaves and, as a result, for the entire elevator system.

Claims 3-5 and 17-19 are directed to particular roping configurations that may be advantageously combined with the invention of Claims 2 and 16, respectively.

Support for the invention of Claims 2-4 and 16-18 may be found on page 1, line 28 to page 7, line 33, and in figures 1-3. Support for the invention of Claims 5 and 19 may be found on page 1, line 28 to page 6, line 34, and in figures 1 and 2.

Claims 6 and 20 are directed to an elevator system having the elements of the invention described above with respect to Claims 2 and 16, and further including a tension applying mechanism for imparting a downward force on a deflector sheave in order to maintain the drive rope in a taut condition.

One of the principle advantages of this invention is the ability to ensure proper traction between the drive ropes and the drive sheave. Another advantage is the simple and effective means to apply tension to the drive rope without requiring cumbersome and space utilizing mechanisms. A still further advantage of this invention is the ability to apply tension to the drive ropes without requiring an additional interface to the ropes themselves. This last advantage helps to ensure the integrity and safe operation of the ropes by eliminating one potential failure mechanism.

The invention of Claims 6 and 20 is separately patentable and therefore does not stand or fall together with the inventions of Claims 2-5 and 16-19 as a result of the unique feature of the tension applying mechanism. This novel and non-obvious feature may be used to supplement and further optimize the space saving and safety advantages of the invention of Claims 2-5 and 16-20.

Support for the invention of Claims 6 and 20 may be found on page 4, line 32 to page 5, line 5, and in figure 1, and on page 6, line 20-34, and in figure 2.

Claims 13 and 27 are directed to an elevator system having the elements of the invention described above with respect to Claims 2 and 16, and further including both the suspension and drive ropes being made of non-metallic fiber materials.

One of the principle advantages of this invention is the enhanced flexibility of both the suspension and traction ropes as a result of the use of non-metallic fiber materials. Enhancing the flexibility of the ropes results in further minimization of the sheave diameters, which reduces the space required for the sheaves (both drive sheaves and diverter sheaves), the roping configuration, and the drive motor.

The invention of Claims 13 and 27 is separately patentable and therefore does not stand or fall together with the other inventions as a result of the unique feature of the use of non-metallic fiber material in both the suspension and the drive ropes. This novel and non-obvious feature may be used to supplement and further optimize the space saving advantages of the other inventions.

Support for the invention of Claims 13 and 27 may be found on page 2, lines 32-36.

Claims 14 and 28 are directed to an elevator system having the elements of the invention described above with respect to Claims 2 and 16, and further including both the suspension and drive ropes being made of urethane.

One of the principle advantages of the invention of this invention is the enhanced traction of the ropes as a result of the use of urethane, which is a high traction material. Enhancing the traction reduces the need for a tension applying mechanism and thereby reduces the size, cost and complexity of such a mechanism.

The invention of Claims 14 and 28 is separately patentable and therefore does not stand or fall together with the other inventions as a result of the unique feature of the use of urethane in the ropes. This novel and non-obvious feature may be used to supplement and further optimize the advantages of the other inventions.

Support for the invention of Claims 14 and 28 may be found on page 3, lines 29-31.

6. ISSUE

(1) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 2, 5, 6, 16, 19 and 20 over Gale in view of Tokyo Rope?

(2) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 3, 17 and 18 over Gale in view of Tokyo Rope, and further in view of Murtaugh?

(3) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 13, 14, 27 and 28 over Gale in view of Tokyo Rope, and further in view of Aulanko et al.

(4) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 2-4 and 16-19 over Murtaugh in view of Gale and Tokyo Rope.

7. GROUPING OF THE CLAIMS

For the purposes of this Appeal, claims 2-6, 13, 14, 16-20, 27 and 28 do not stand or fall together and will be addressed in the following groups:

Group 1: Claims 2-5 and 16-19;

Group 2: Claims 6 and 20;

Group 3: Claims 13 and 27; and

Group 4: Claims 14 and 28.

An explanation of why the Applicant believes the identified groups of claims are separately patentable was presented in the Summary of the Invention section above.

8. ARGUMENT

(1) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 2, 5, 6, 16, 19 and 20 over Gale in view of Tokyo Rope?

Applicants respectfully submit that the Examiner has not met the burden of proof required to support a rejection under 35 U.S.C. §103. When an application is submitted to the Patent and Trademark Office, case law dictates that 35 U.S.C. §103 places the burden of proof on the PTO to establish a prima facie case of obviousness.[1] Once the prima facie case has been established, then the burden of going forward with the evidence to rebut the prima facie case shifts to the applicant. Only the burden of going forward with evidence to rebut shifts to the applicant, however. The burden of persuasion remains with the PTO.

Further, in order to support a prima facie obviousness type rejection, the Examiner must take into account all the limitations in the rejected claim[2], including any limitations expressed using functional language[3]. Further, the obviousness must be determined based on the claimed subject matter as a whole, including any results and advantages produced by the claimed subject matter[4]. In order to use a combination of references to establish a prima facie case of obviousness, there must be some teaching, suggestion or incentive to support the

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[1] In re Fritch, 23 U.S.P.Q. 2d. 1780 (Fed. Cir. 1992), In re Piasecki, 745 F.2d. 1468, 1471-1472, 223 U.S.P.Q. 785, 787-788 (Fed. Cir. 1984).

[2] Carl Schenck, A.G. v. Nortron Corp., 713 F.2d 782, 218 U.S.P.Q. 698 (Fed. Cir. 1983); Carman Industries v. Wahl, 724 F.2d 932, 220 U.S.P.Q. 481 (Fed. Cir. 1983).

[3] Lewmar Marine, Inc. v. Barient, Inc., 827 F.2d 744, 3 U.S.P.Q.2d 592 (Fed. Cir. 1983).

[4] Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 7 U.S.P.Q.2d 1315 (Fed. Cir. 1988); In re Chupp, 816 F.2d 643, 2 U.S.P.Q.2d 1437 (Fed. Cir. 1987); Fromson v. Advanced Offset Plate, 755 F.2d 1549, 225 U.S.P.Q. 26 (Fed. Cir. 1985).

specific combination of references[5]. In addition, a prima facie case of obviousness in not proper and cannot be made if the suggested modification of a reference destroys the intent, purpose or function of the invention disclosed in the reference[6].

Applicant respectfully submits that the rejection of these claims does not met the required burden of proof for the following reasons: it fails to take into consideration all of the results and advantages of the Applicants invention and there is no motivation to combine the two references.

As discussed in the Summary of Invention above, one of the principle benefits of the claimed invention is the minimized space requirements for the elevator system. This benefit is derived from the use of flat ropes for both the drive ropes and the suspension ropes. Applicant has recognized that this feature will result in smaller diameter sheaves for both the drive sheave and the diverter sheaves.

Gale discloses a system that uses flat leather belts as drive ropes, but uses conventional steel cables as the suspension ropes. The objective of Gale is to take advantage of the increased friction of the wide leather belts to drive the unbalanced load while maintaining the conventional steel cables for the suspended loads of the elevator system. There is no hint or suggestion within Gale of the ability to use smaller sheaves with flat ropes, nor of the desire to do so, to minimize the space requirements of the elevator system.

To overcome this deficiency of Gale, Examiner has combined it with the teachings of JP '811. Unfortunately, since this is a Japanese patent application, a translation has to be used to determine its contents. This translation describes a "ribbon form" rope used in elevator systems. Exactly how this "ribbon form" rope is used is at issue.

Only one reference in the entire document refers to its possible use as "hoisting rope or balance rope". There are two possible interpretations for this statement. The first is that the "ribbon form" rope is being suggested for use as a rope for suspension and drive applications in an elevator system. This is the interpretation seized upon by the Examiner in making this rejection, even though there is no discussion within JP '811 of the possible use of this rope in either a traction or suspension application, and therefore nothing to confirm this interpretation.

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[5] In re Geiger, 815 F.2d 686, 2 USPQ2d 1276 (Fed. Cir. 1987); ACS Hospital Systems Inc. v. Montefiore Hospital, 732 Fed.2d 1572, 221 USPQ 929 (Fed. Cir. 1984).
[6] In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)

The second interpretation is that the reference to the JP '811 "ribbon form" rope as a "hoisting" rope is simply a statement that the rope may be used in hoisting systems such as elevators. In elevator systems there are many different types of ropes. These include suspension ropes, traction ropes, traveling cables and compensation ropes. In conventional traction drive elevator systems, the suspension ropes and traction ropes are one and the same: they carry the suspended loads of the elevator system and are engaged with a traction machine to drive the car and counterweight. Traveling cables are essentially electrical cables that provide means to transfer power and communications to the car as it travels through the hoistway.

Compensation ropes are attached such that they hang from the car and counterweight. The purpose of compensation ropes is to balance the suspended loads of the ropes as the car and counterweight move within the hoistway. For instance, if the car is at the top of the hoistway and the counterweight is at the bottom, most of the weight of the suspension ropes is on the counterweight side. By attaching a set of compensation ropes that extend from the car to the counterweight, this unbalance in the system becomes balanced.

Compensation ropes are not engaged with traction sheaves, are not driven, and do not carry any of the suspended loads of the elevator system other that their own weight. One of the issues with compensation ropes is that, since they simply hang from the car and counterweight, they can interfere with each other and generate noise or tangles. One of the solutions to this problem is to fix the ropes together, such as by placing them is a woven jacket. Another issue is that since the compensation ropes are not under significant tension, the inherent stiffness of the compensation ropes may cause the hanging ropes to bow and contact the hoistway walls. This also leads to increased noise.

When the JP '811 document is read in light of an understanding of the different types of ropes used in elevator systems, it becomes clear that JP '811 is describing compensation or balance ropes. Other than the single instance of the use of the word "hoisting", the remainder of the document describes the problems and possible solutions for compensation ropes. This is bore out by the objective of the JP '811 invention, which is to replace the prior art, knitted together ribbon form ropes with a fused ribbon rope to take advantage of higher flexibility of this type of rope to prevent the balancing ropes from bulging or bowing such that they contact the hoistway walls. If these ropes were intended for use as suspension ropes, bulging or bowing of the ropes would not be an issue due to the tension in the ropes from the suspended

loads. One skilled in the art of elevator systems would recognize the intended application of the ropes described in JP '811 and not draw the conclusion that they are, or even could be, used to drive or suspend an elevator system.

As for the case at hand, there is nothing in either reference that recognizes or suggests the benefits of Applicant's invention. Neither reference discloses or even suggests the benefits of minimal space requirements that results from the use of flat ropes for both the drive and suspension ropes. Gale discloses the use of flat leather belts for improved traction, not for minimizing sheave diameters. Therefore, there is no motivation to change the steel cable type suspension ropes to flat ropes. JP '811 discloses compensation ropes encapsulated within a jacket material to overcome the problems associated with knitted ropes. Therefore, there is no suggestion to use these ropes in an application such as Gale. Since this rejection fails to take into consideration all of the results and advantages of the Applicant's invention, it fails to recognize that this combination of references does not obviate Applicant's invention.

Further, Applicant submits that there is no motivation to combine the two references. Gale discloses using leather belts to enhance traction, but keeps conventional steel cables for the suspended loads. JP'811 discloses a fused ribbon form compensation rope. Examiner cites the motivation of making the suspension ropes of Gale more flexible and corrosion resistant. There is no motivation within Gale to make the steel cables more flexible as it would not provide any obvious benefit. As for corrosion resistance, one skilled in the art is aware that there are more practical methods to prevent corrosion of elevator ropes, such as the use of lubrication as is conventional.

Claims 5 and 19 depend from Claims 2 and 16, respectively, and are patentable for the same reasons as discussed above.

Therefore, with respect to the rejection of Claims 2 and 16, along with Claims 5 and 19, which depend from Claims 2 and 16 respectively, this rejection fails to meet the burden of proof required to support a rejection under 35 U.S.C. §103. In view of the traversal of this rejection, Applicant respectfully requests that this rejection be reversed.

Claims 6 and 20 are also dependant from Claims 2 and 16 and therefore patentable for the same reasons. In addition, these claims include an element of a tension applying mechanism for imparting a downward force on the deflector sheave in order to maintain the

drive rope in a taut condition. As discussed in the Summary of Invention, this invention is a simple and space saving mechanism to ensure adequate tension in the drive ropes.

These claims were rejected by the Examiner with the allegation that Gale discloses a tensioning mechanism comprising weight 12 and sheave 27. Applicant does not dispute that Gale discloses a tensioning mechanism, and that it includes a weight 12 and a sheave 27. Applicant does, however, disagree that this mechanism disclosed in Gale is the claimed invention of Claims 6 and 20.

The mechanism of Gale uses the weight 12 to apply tension directly to the rope. As a result, there is a need for a guidance system 13 for the weight and a buffer type mechanism 14 for the weight, not to mention the additional space required for the entire tensioning apparatus. The sheave 27 is simply used to redirect the rope to the weight guidance mechanism.

There is, however, no mechanism that *applies a downward force on the deflector sheave in order to maintain the drive rope in a taut condition.* Applicant's tensioning system uses the existing deflector sheave to apply the tensioning force to the rope and thereby minimizes the need for additional structure, such as guidance mechanisms. The system of Gale applies a downward force directly *on the rope* to maintain the drive rope in a taut condition. The sheave 27 of Gale also has a downward force applied to it, but it is the result of the tension in the rope. The difference between the two systems is as follows: in the claimed invention, the deflector sheave applies the tensioning force to the rope; in Gale, the tensioned rope applies the downward force to the sheave.

Therefore, with respect to the rejection of Claims 6 and 20, this rejection fails to meet the burden of proof required to support a rejection under 35 U.S.C. §103. In view of the traversal of this rejection, Applicant respectfully requests that this rejection be reversed.

(2) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 3, 17 and 18 over Gale in view of Tokyo Rope, and further in view of Murtaugh?

Applicant respectfully submits that Examiner has not met the burden of proof required to support this rejection under 35 U.S.C. §103.

According to this rejection, Gale is combined with JP '811 in order to produce the claimed invention of Claims 2 and 16. For the reasons discussed above, this combination of references does not meet the burden of proof required to support the rejection of Claims 2 and 16 and, therefore, Claims 3, 17 and 18 are also patentable as they depend from Claims 2 and 16.

Next, this rejection further adds the Murtaugh reference to show suspension ropes coupled at its first and second ends to the upper portion of the hoistway. The Murtaugh reference describes a hand powered dumb waiter. The motivation cited by the Examiner for this combination is to "effectively alter the length of the suspension rope in order to ensure the proper length". This alleged motivation is absurd. To ensure the proper length for the suspension ropes, the ropes must be cut to length. It doesn't matter if the elevator is roped in a 1:1 configuration or a 2:1 configuration, or if the ropes are terminated on the car or at a fixed point in the hoistway, the proper length is determined from the cut length not the particular roping arrangement.

In response to this, Examiner then alleges that stretching of the ropes may occur and that Murtaugh "allows the stretching to be compensated for by adjusting an anchor point". This again is absurd. Why would one want to adjust the anchor point rather than simply shorten the stretched ropes, as one skilled in the art would do? In particular, why would one want to adjust the anchor point when it is at the upper portion of the hoistway and in a generally inconvenient location? The motivation to make this combination is not within the documents or within the general knowledge, and clearly not within this rejection.

Therefore, this rejection of Claims 3, 17 and 18 fails to meet the burden of proof required to support a rejection under 35 U.S.C. §103. In view of this traversal, Applicants respectfully request reversal of this rejection.

(3) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 13, 14, 27 and 28 over Gale in view of Tokyo Rope, and further in view of Aulanko et al.

Applicant respectfully submits that Examiner has not met the burden of proof required to support this rejection under 35 U.S.C. §103.

According to this rejection, Gale is combined with JP '811 in order to produce the claimed invention of Claims 2 and 16. For the reasons discussed above, this combination of

references does not meet the burden of proof required to support the rejection of Claims 2 and 16 and, therefore, Claims 13, 14, 27 and 28 are also patentable as they depend from Claims 2 and 16.

Therefore, this rejection of Claims 13, 14, 27 and 28 fails to meet the burden of proof required to support a rejection under 35 U.S.C. §103. In view of this traversal, Applicants respectfully request reversal of this rejection.

(4) Whether the Examiner has met his burden to establish a prima facie case of obviousness under 35 U.S.C. 103 in the rejection of Claims 2-4 and 16-19 over Murtaugh in view of Gale and Tokyo Rope.

Applicant respectfully submits that Examiner has not met the burden of proof required to support this rejection under 35 U.S.C. §103.

Murtaugh, as discussed previously, is a hand powered dumb waiter. Examiner acknowledges that Murtaugh does not show a drive motor with a drive sheave in the bottom portion of the hoistway engaging the drive rope or that the ropes are flat. This is clear since Murtaugh does not have a drive motor, does not have a drive sheave, does not have a drive rope and none of the ropes in Murtaugh are flat. Examiner then uses Gale as the source to add a drive motor, a drive sheave and a flat traction rope to Murtaugh. Since this wholesale rearrangement and replacement of Murtaugh's components is not sufficient to meet all of the elements of the claimed invention, Examiner then adds JP '811 in order to replace the suspension rope of Murtaugh with the compensation rope of JP '811.

The only original elements of Murtaugh still left after this modification are the car, the counterweight and the one sheave engaged with the suspension rope. When viewed in this perspective, it is clear that this rejection involves quite a bit of hindsight reconstruction.

The motivation cited in the rejection for making such wholesale changes to Murtaugh are not sufficient to support the rejection. The cited motivation for adding all the elements of Gale is to provide for less manual labor in raising and lowering the elevator. While this may be sufficient motivation to motorize one of the pulleys of Murtaugh, it does not justify the adding all of the elements of Gale, nor does it justify the use of flat ropes.

The cited motivation for adding the elements of JP '811 is to make the suspension rope of Murtaugh more flexible and corrosion resistant. As Murtaugh is a dumb waiter and used to lift only light loads, it is not apparent why increasing the flexibility of the suspension rope is a benefit. In addition, there are more practical methods to make the rope corrosion resistant as discussed previously.

Therefore, this rejection of Claims 2-4 and 16-19 fails to meet the burden of proof required to support a rejection under 35 U.S.C. §103. In view of this traversal, Applicants respectfully request reversal of this rejection.

CONCLUSION

As Applicants have traversed each and every rejection raised by the Examiner, it is respectfully requested that the rejections be reversed and the rejected claims be passed to issue. Please charge any additional fees or credit overpayment to Deposit Account No. 15-0750, Order No. OT-4331.

Respectfully submitted,

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9. APPENDIX

Claims involved in the Appeal:

2. An elevator system comprising:

an elevator hoistway defined by surrounding structure;

an elevator car and counterweight located in the hoistway; and

a drive motor including a drive sheave located at a bottom portion of the hoistway, the drive motor being coupled to the elevator car and the counterweight via at least one flat rope for moving the elevator car upwardly and downwardly along the hoistway, wherein the at least one flat rope includes a suspension rope coupled to the elevator car and the counterweight, and a drive rope engaging the drive sheave for moving the elevator car along the suspension rope.

3. An elevator system as defined in claim 2, wherein the suspension rope is coupled at its first and second ends to an upper portion of the hoistway.

4. An elevator system as defined in claim 2, further including at least one elevator sheave coupled to an underside of the elevator car, a deflector sheave coupled within an upper portion of the hoistway, and a counterweight sheave coupled to a top portion of the counterweight, the suspension rope having its first and second ends coupled to an upper portion of the hoistway, the suspension rope extending downwardly from its first end, underslinging the elevator car via the elevator sheave, extending upwardly and looping about the deflector sheave, extending downwardly and looping about the counterweight sheave and extending upwardly and terminating at its second end.

5. An elevator system as defined in claim 2, further including a deflector sheave located at a lower portion of the hoistway, and wherein the drive rope has first and second ends, the drive rope having its first end coupled to a bottom portion of the counterweight and its second end coupled to a bottom portion of the elevator car, the drive rope extending downwardly from its first end, looping about the drive sheave, extending toward and looping about the deflector sheave and extending upwardly and terminating at its second end at the bottom portion of the elevator car.

6. An elevator system as defined in claim 5, further including a tension applying mechanism for imparting a downward force on the deflector sheave in order to maintain the drive rope in a taut condition.

7. An elevator system as defined in claim 6, wherein the tension applying mechanism includes a weight suspended from a tension spring, and a rigid connector pivotally coupled at a first end to the drive sheave, coupled at a second end to the weight and coupled between its first and second ends to the deflector sheave, whereby the weight imparts a downward force on the deflector sheave in order to maintain the drive rope in a taught condition.

13. An elevator system as defined in claim 2, wherein the suspension rope and the drive rope are made of non-metallic fiber material.

14. An elevator system as defined in claim 2, wherein the suspension rope and the drive rope are made of urethane.

16. An elevator system comprising:

an elevator hoistway;

an elevator car located in the hoistway; and

a drive motor located at a bottom portion of the hoistway, the drive motor being coupled to the elevator car via at least one flat rope for moving the elevator car along the hoistway, wherein the at least one flat rope includes a suspension rope coupled to the elevator car and a drive rope engaging the drive motor for moving the elevator car.

17. An elevator system as defined in claim 16, wherein the suspension rope is coupled at its first and second ends to an upper portion of the hoistway.

18. An elevator system as defined in claim 16, further including at least one car sheave coupled to the elevator car, the suspension rope having its first and second ends coupled to an upper portion of the hoistway, the suspension rope extending downwardly and engaging the elevator car via the car sheave.

19. An elevator system as defined in claim 16, further including a deflector sheave located at a lower portion of the hoistway, and wherein the drive rope is engaged with the elevator car, the drive rope extending downwardly from the car, looping about the drive sheave, extending toward and looping about the deflector sheave.

20. An elevator system as defined in claim 19, further including a tension applying mechanism for imparting a downward force on the deflector sheave in order to maintain the drive rope in a taut condition.

21. An elevator system as defined in claim 20, wherein the tension applying mechanism includes a weight suspended from a tension spring, and a rigid connector pivotally coupled at a first end to the drive sheave, coupled at a second end to the weight and coupled between its first and second ends to the deflector sheave, whereby the weight imparts a downward force on the deflector sheave in order to maintain the drive rope in a taught condition.

27. An elevator system as defined in claim 16, wherein the suspension rope and the drive rope include non-metallic fiber material.

28. An elevator system as defined in claim 16, wherein the suspension rope and the drive rope include urethane.